

Allread et al. (US 5,406,980) discloses a quick connect coupling with a fixed post and a movable valve member surrounding the post in one component of the coupling and a poppet in the other component.

REMARKS

Drawings

Objection has been made to the drawings under 37 CFR 1.83(a) for failing to show every feature of the invention specified in the claims because "the first separable component" must be shown as "inserted completely into a second component", or the feature(s) canceled from the claim(s).

However, Sec. 1.83(a) also provides that conventional features disclosed in the description, where their detailed illustration is not essential, can be illustrated in the form of a labeled representation. Accordingly, Applicant proposes to use such a label.

Specification

In order to comply with the requirement of 37 CFR 1.72(b) for an abstract of the disclosure, an abstract on a separate sheet is attached at the end of this response.

Claim Objections

To overcome the objection to claims 17-20 because of informalities, "grove" on line 10 of claim 17 has been changed to "groove."

Claim Rejections - 35 USC Sec. 112

The rejection of claims 4 and 7-16 under 35 U.S.C. 112, first paragraph, is respectfully traversed. The rejection has been made on the basis that the subject matter has not been described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In Claims 4 and 7-12, the objection is that the specification fails to describe "the first separable component inserted completely into a second component". To the contrary, the specification states on page 4, beginning at line 6:

Ink is supplied to the reservoir independently of actuation by the reservoir by a duplex coupler having a first separable component insertable completely into a second component and locked in place. (Emphasis added).

Accordingly, it is clear from the specification that the first or the second element can be completely inserted into the other. While it is true that when the claims are considered with respect to the prior art, they include insertion to a point where front ends of the components abut one another and the components are locked in place, the specification also teaches complete insertion.

In claims 13-16 the objection is that the specification fails to describe inserting the other component of the two-component coupler into a replaceable ink bottle. To the

contrary, the specification states, for example, on page 6, beginning at line 12:

In a method of the invention for operating an ink jet system, the steps include (a) inserting one component of a two-component coupler in an ink reservoir; and (b) inserting the other component of the two-component coupler into a replaceable ink bottle. (Emphasis added).

With respect to the rejection of claims 2 and 12 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, the helpful suggestions by the Examiner have been adopted.

Accordingly, in claim 2, insertion of a colon has been made following "comprises" and indentation on a separate line has been made of "a flexible tube; and".

In claim 12, "said duplex valve" has been changed to "duplex [valve] coupler" to provide antecedent basis.

The Rejection of Claims 1-12 and 17-20
Over Niedermeyer, Ramacier and Preszler

This rejection for unpatentability under Sec. 103 is respectfully traversed.

The Complete Teaching of Niedermeyer

Niedermeyer et al. (US 5,343,226) is said to teach the claimed invention "except the means for supplying ink to the reservoir independently of actuation by the reservoir". To the contrary, in addition to requiring reservoir actuation, Niedermeyer has no teaching or suggestion what so ever of a duplex coupler. Instead, the replaceable ink supply of

Niedermeyer is mounted on the cover 53 of the reservoir 10, and the replaceable ink supply includes a valve mechanism which interrupts gravity feed of ink into the base 52 of the reservoir 10. As shown in Figs. 10 and 11, the integrated ink supply includes a container 60 having a neck 86 which is engaged by a threaded cap 88 terminating in a projection 89 having an opening 90 that is specifically adapted to be aligned with an actuating member 62 in the base 52 of the reservoir 10.

Accordingly, the invention distinguishes over Niedermeyer for having other features besides the elimination of any necessity for having a valve actuated by the reservoir. Moreover, valve actuation by the reservoir is the essence of the invention claimed in Niedermeyer where all four claims specifically require "valve actuating means" in the supply base for operating a valve member mounted in the opening of the ink container.

The Complete Teaching of Ramacier

The second applied reference, Ramacier, Jr. et al. (US 5,316,041), is said to disclose a duplex connector consisting of a quick-connect coupling valve assembly which facilitates fluid connection and disconnection without leakage. Particular attention has been directed to Fig. 2 and, with respect to the fixed post limitation of claim 9, to Figs. 23-24C.

While applicant acknowledges that Ramacier does disclose a quick-connection coupling valve, the specific teaching is for flexible tubes utilized in biomedical applications, instrument connection and fluid dispensing assemblies. Ramacier emphasizes that in the medical industry or fluid dispensing industry it is very desirable and critical to keep fluid containers sealed until the time of use and it is desirable have precise volumes of fluid dispense with out leakage.

There is nothing in the primary reference Niedermeyer to suggest the desirability of having the ink container sealed until the time of use nor does Niedermeyer have any desirability to have precise volumes of fluid dispense without leakage. Since the teachings of Niedermeyer and Ramacier are so disparate, the use of Ramacier in an ink jet system can be made only in the light of the invention with the use of hindsight.

The Complete Teaching of Preszler

The third and remaining applied reference, Preszler (US 5,293,913) is said to teach a means by which elements of a duplex coupler may be connected to an ink bottle and ink reservoir, i.e., by threaded connections. The specific teaching in Preszler is that to insure the proper placement of bottles it is important to prevent male components from being mounted on incorrect female components. In order to accomplish that objective a first key is first formed on a

first male component and a complimentary key-way is formed on a first female component. Each key and key-way includes first and second projections. The first projection is located in a reference position and the second projection is located a predetermined distance from the reference position so that the distance for each component pair is used for identification.

There is nothing in the teaching and disclosure of Preszler to suggest adapting Ramacier to any system much less the completely unrelated ink system of the primary reference Niedermeyer.

Conclusion as to Claims 1-12 & 17-20

It would not have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the duplex connector of Ramacier et al. for the valve structure in Niedermeyer et al. because the teachings of these references are completely contrary. In addition, where connections are provided as taught by Preszler, they are for the purpose of preventing male components from being mounted on incorrect female components. This has nothing to do with the invention and the matter of providing a valve assembly which facilitates quick fluid connection and disconnection without leakage.

Detailed Discussion of Claims 1-12 and 17-20

Claim 1

This claim distinguishes over the cited combination of

references by being directed to an ink jet system with an ink reservoir connected to an ink jet head and supplied with ink independently of actuation by the reservoir.

It is acknowledged that the primary reference does not disclose or teach supply of ink independently of reservoir actuation, and the combination with the secondary references can be made only in the light of the invention.

Claim 2

This claim provides for causing ink flow, independently of reservoir actuation, through a flexible tube to which pressure is applied through a pumping orbit from a static position out of squeezing contact with the tube to a position of squeezing contact with the tube.

There is no basis for ink flow independently of actuation by a reservoir except in the light of the invention.

Claim 3

In the ink jet system of claim 1 the means for supplying ink to said reservoir independently of actuation by said reservoir comprises a duplex coupler having separable components. The use of a duplex coupler in an ink jet system is apparent only with hindsight.

Claim 4

In this claim the duplex coupler for supplying ink to the reservoir independently of actuation by the reservoir comprises a first separable component inserted into a second component and locked in place. The use of such a duplex

coupler in an ink jet system is apparent only with hindsight.

Claim 5

In this claim the duplex coupler that is not actuated by the reservoir comprises a first component inserted partially into a second component. The use of a partially inserted duplex coupler in an ink jet system is apparent only with hindsight.

Claim 6

In this claim the duplex coupler comprises a first component separated from a second component. The use of a separated duplex coupler in an ink jet system is apparent only with hindsight.

Claim 7

In this claim the first component and the second component both have a front end and a back end, a first portion and a second portion, with a front end of the first coupling member received in the second portion of the second coupling member. The use of such a duplex coupler in an ink jet system is apparent only with hindsight.

Claim 8

In this claim a poppet is reciprocally disposed in one component and acted upon by the other component to open a fluid passageway. The use of a poppet in an ink jet system is apparent only with hindsight.

Claim 9

In this claim the other component contains a fixed post. The use of a post coupler in an ink jet system is apparent only with hindsight.

Claim 10

In this claim a second poppet is reciprocally disposed in the other component, with a tip end of the first poppet and a tip end of the second poppet engaged against each other, forcing each other to open a fluid passageway between the component. The use of a poppet coupler in an ink jet system is apparent only with hindsight.

Claim 11

In this claim a first spring is compressively received between a poppet and a back end of the first component, and a second spring is compressedly received between a poppet and a back end of the second component; whereby the springs bias the poppets forwardly when their tip ends are disengaged from each other when the first component is disconnected from the second component. The use of such a duplex coupler in an ink jet system is apparent only with hindsight.

Claim 12

In this claim the coupler comprises a first coupling member inserted into a second coupling member and locked in place, and at least one of the coupling members contains a poppet that closes when biased forwardly to seal the fluid

passageway through the coupling member containing the poppet. The use of such a coupler in an ink jet system is apparent only with hindsight.

Claim 17

In this claim an ink jet system includes a container for ink-jet ink and having an outlet; and a cap for sealing the outlet of the container until ink in a reservoir of an ink-jet system is to be replenished; the cap comprising a base positionable upon the container and a hollow neck extending from the base and having an exterior surface containing (1) a circumferential groove for receiving a locking collar when ink in a reservoir of an ink-jet system is to be replenished and (2) a taper beyond the circumferential groove for facilitating the entry of the locking collar into said groove. This is neither taught nor disclosed by the references, taken singly or in combination.

Claim 18

In this claim the container has ink-jet ink, the base is threaded upon the container and the cap seals the outlet until a reservoir of an ink-jet system is to be replenished. This is neither taught nor disclosed by the references, taken singly or in combination.

Claim 19

In this claim the neck contains a flow channel with a reciprocals poppet therein and means for biasing the poppet closed to prevent the flow of ink from said container until

said container is needed to replenish ink in a reservoir of an ink-jet system. This is neither taught nor disclosed by the references, taken singly or in combination.

Claim 20

In this claim the poppet has a circumferential grommet for forming a circumferential seal. This is neither taught nor disclosed by the references, taken singly or in combination.

The Rejection of Claims 13-16

The rejection of claims 13-16 under 35 U.S.C. 103(a) as being unpatentable over Niedermeyer et al. (US 5,343,226) in view of Ramacier, Jr. et al. (US 5,316,041), Preszler (US 5,293,913), and Ito (US 6,053,603) is respectfully traversed.

The combination of Niedermeyer et al. in view of Ramacier, Jr. et al. and Preszler, as discussed above with regard to claims 1-12 and 17-20, does not apply to claims 13-16, and this combination does not suggest the claimed invention except the insertion of the other component into a bottle.

In any event, there is no applicable teaching in Ito, who discloses providing a pipe 40a which extends into a bottle as part of a connector which connects the bottle to an ink reservoir (see in particular Fig. 4(d)). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a pipe as taught by

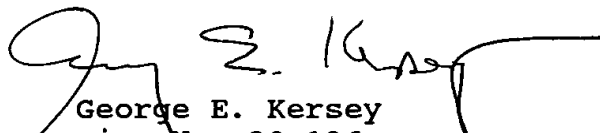
Ito extending from the other component for the purpose of facilitating connection of the other component to a bottle having a pierceable obstruction, including such well known obstructions as a foil or a rubber stopper.

Moreover, the steps of method claims cannot be deemed to be "clearly obvious" in view of the disparity in the functions of the structure in the improper combination discussed above.

Invitation to the Examiner

The Examiner is invited to contact Applicant's Attorney at the number given below if there are any questions or comments.

Respectfully submitted

A handwritten signature in black ink, appearing to read "George E. Kersey", with a long horizontal line extending to the right.

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